## MILESTONES & SCHEDULE

| CODE | MILESTONE | DATE |
|---|---|---|
| ***A - Administration*** | ***Software engineering plan completed - review board selected.*** | ***03/29/02*** |
| ***E - Code Improvement*** | ***Code Baselines, Scaling Analysis, Performance Analysis completed (generate scaling curves for codes which are already parallel, baseline serial performance for codes which are not already parallel) Documented source code made publicly available via the Web.***<br>serial code PARK with 15,000 elements for 500 time steps - uses parallel multipole library, but serial main routine.<br>serial code GeoFEST - includes serial iterative solver. 50,000 elements 1000 timesteps - serial implementation<br>serial code Virtual California with N=215 segments for 10,000 time steps, serial implementation on 1 GHz workstation | ***07/30/02*** |
| ***H - Interoperability*** | ***Come to agreement on design policy for interoperability and community delivery - Review board approves requirements and a preliminary design for functionality.***<br>Requirements and preliminary design documents published on the web | ***07/30/02*** |
| ***B - Administration*** | ***First Annual Report delivered.*** | ***08/30/02*** |
| ***I - Interoperability***<br><br>OPTIONAL MILESTONE | ***Complete prototype described in milestone "H" and test with improved codes. Review board approves.***<br>Demonstration of interface of Gateway and GeoFEST with simple visualization satisfying preliminary design requirements<br>Mesh generation - Demonstrate ingesting fault geometry and rheology from federated DB, to generate a starting mesh.<br>Functional fault DB and documentation for Southern California<br>Riva: Produce movies of the strain, stress, and displacement data generated from Virtual California and GeoFEST of 1 km resolution for S. California in an integrated way through the grid framework. | ***02/27/03*** |

| CODE | MILESTONE | DATE |
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| ***F - Code Improvement*** | ***First code improvement (functional enhancement and speedup) Documented source code made publicly available via the Web.***<br>PARK on 256 CPU machine with 150,000 elements, 5,000 time steps in the same time as the baseline case<br>GeoFEST - links to PYRAMID and runs on a parallel machine - Produce a plot of scaled speedup that will show that we are maintaining effiency as the number of processors and problem size increase. Assuming availability of a 64 CPU Beowulf, 1,250,000 elements, 1000 timesteps, in the same time as the baseline case. | ***06/30/03*** |
| ***C - Administration*** | ***Second Annual Report delivered.*** | ***08/30/03*** |

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| ***J - Interoperability*** | ***Full implementation using improved codes. Review board approves integration into completed framework and updated documentation for:***<br>Mesh generation - Demonstrate adaptive mesh capability within GeoFEST using a fault stepover geometry wherein the mesh is adapted to accommodate large strains in the stepover as the displacement on the main faults grows.<br>Virtual California<br>SLIDER<br>Phase Dynamical Probability Change Index<br>Data Mining via Karhunen-Loeve Space-Time Pattern Analysis<br>STRESSCO codes as an example of FLTGRV, FLTGRH, STRGRV, STRGRH)<br>DataMining via Genetic Algorithm Analysis<br>Hidden Markov Model - demonstrate interaction with federated DB through framework<br>Disloc<br>Visco<br>SIMPLEX<br>Final fault DB for California with documentation | ***02/27/04*** |
| *OPTIONAL MILESTONE* | *ParVox: Provide an interactive volumetric visualization tool to permit user-controlled view from arbitrary vantage points inside a volume, displaying 3D structure, strain, physical properties, meshes, and seismicity through the grid framework.*<br>*PARK on 1024 CPU machine with 400,000 elements, 100,000 time steps*<br>*GeoFEST (assuming availability of 880 processor machine) 16M elements, 1000 time steps using the Pyramid AMR libraries*<br>*Virtual California with N=700 segments for 10000 time steps, MPI parallel implementation, running on M-processor machine, speedup of approximately M/10. Investigation of fast multipole method for this code.*<br>*Source code for all modules is published on web* | |

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| ***G - Code Improvement*** | ***2nd code improvement - further optimization for some codes, pick up others that were neglected in 1st improvement - documented source code made publicly available via the Web.***<br>PARK on 1024 CPU machine with 400,000 elements, 50,000 time steps in 5 times the baseline code<br>GeoFEST (assuming availability of 880 processor machine) 16M elements, 1000 time steps in the same time as the baseline code using the Pyramid AMR libraries<br>Virtual California with N=700 segments for 10,000 time steps in 1 hour or less, MPI parallel implementation, running on M-processor machine, with 2 GB of memory per CPU, speedup of approximately M/2 on up to 256 processors. Investigation of fast multipole method for this code.<br><br>*PYRAMID: Mesh generation - Demonstrate adaptive mesh capability within GeoFEST using a fault stepover geometry wherein the mesh is adapted to accommodate large strain gradients in the stepover as the displacement on the main faults grows, and coarsening of the mesh in areas wherein the strain field grows smoother.*<br><br>*Source code for all modules is published on web* | ***06/30/04*** |
| *OPTIONAL MILESTONE* | | |
| ***K - Interoperablity*** | ***Customer delivery - Documented source code made publicly available via the Web***<br>Demonstrate integration of one external user application into the framework using the GRID framework wizards<br>Issue testable 5 year earthquake forecast for M>5 for S California<br>Publish the availability of the Portal to the Earthquake community in a peer reviewed periodical such as "Concurrency: Practice and Experience", or "EOS" or an AGU journal. | ***09/30/04*** |
| ***D - Administration*** | ***Final Report delivered*** | ***11/30/04*** |